REMARKS

Applicants respectfully request reconsideration and further examination of the patent application under 37 C.F.R. § 1.111.

CLAIM REJECTIONS UNDER 35 U.S.C. § 103

On pages 2-6 of the Office Action, the Examiner rejects claims 1-10, 12-14, 18, 19 and 20 under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 5,040,064 to Cok (Cok) in view of AAPA and in further view of U.S. Patent No. 5,105,276 to Schrock (Schrock).

The response to the previous Action filed in connection with this application amended claim 1 to incorporate the subject matter of the previously allowed claim 11 with the intent of expediting the allowance of the application as was indicated by the Examiner. The current Action, however, withdraws the previously allowed claims invention by citing Schrock for teaching the added limitation of the cancelled claim 11, when the claimed invention is distinguished from the applied prior art regardless of what Schrock teaches.

The Action asserts that "AAPA teaches a multiplication register for multiplying charge produced by the CCD imager wherein the image data analyser is arranged to detect the boundaries of horizontal smears produced by incomplete charge transfer in the multiplication register (Page 1)." Assuming that AAPA refers to EP 866501, it is submitted that this reference merely disclose a multiplication register for multiplying charge produced by a CCD imager. There is no teaching or suggestion anywhere in the AAPA for detecting boundaries of "horizontal smears produced by incomplete charge transfer." Indeed, this reference makes no reference to the problem of smearing due to incomplete charge transfer that would lead one of ordinary skill in the art to combine it with Cok. This is because Cok only discloses a CCD camera (col. 1, line 21), but not a "multiplication register" that is subject to "incomplete charge transfer."

Referring to column 3, lines 2-15, the Action incorrectly asserts that Cok teaches incomplete scanning when in fact the cited section discusses sampling frequency for "information image bands." More specifically, Figure 1, and Figures 2 and 3 of Cok illustrate portions of the pixel array of the CCD camera 11. The cited section states that typically the green channel of the image

6

is fully sampled, while the red and blue channels are sampled at a lower frequency, primarily because human eye has greatest sensitivity in the green region of the spectrum. Typically, the individual pixels of the CCD array have fixed red, blue and green filters in front of them. For example, the pixels P1, P2, P3 produce fully sampled values L1, L2, L3 etc, while the pixels P0, Pn produce sub-sampled values because those pixels are interspersed at every nth location. Thus, there could be three green pixels followed by one red (or blue) pixel ("n" is typically 2, 4 or 8 – as disclosed in col. 3, line 65). It then becomes necessary to interpolate red or blue pixels corresponding to each green pixel locations from the fewer red or blue pixels from which a signal is obtained. The CCD array of Cok is read out by clocking charge from the bottom row into a serial output register, and each row above is clocked into the row next below. Because the stream of data from the output register consists of data from fewer red and blue pixels than from green pixels per unit time (since there are fewer red and blue pixels than green pixels), Cok teaches sampling the red and the blue pixels at a lower rate. The sampling at a lower rate as taught by Cok, however, does not imply incomplete charge transfer. This is because each pixel of Cok's array records a charge corresponding to the respective colour filter and there is therefore no teaching or suggestion whatsoever in Cok about incomplete charge transfer.

Accordingly, based on an incorrect premise about scanning/sampling, the Action summarily concludes that incomplete scanning leads to incomplete charge transfer. Not having cited any supporting evidence for this conclusion, the Action in effect equates image scanning with charge transferred within a pixel array disregarding the fact that an incomplete scan does not necessarily involve incomplete charge transfer. This is because a complete charge transfer could occur during an incomplete scan and a complete scan could involve an incomplete charge transfer.

Even assuming that the skilled person would have been motivated to add the multiplication register of AAPA to Cok's CCD camera, there is still no teaching or suggestion regarding "incomplete charge transfer in the multiplication register" and consequently regarding an "image data analyser ... arranged to detect the boundaries of horizontal smears produced by incomplete charge transfer in the multiplication register." The Action cites col. 2 line 47-col. 4 line 20 of Cok for detecting the boundaries of horizontal smears. In fact the cited section discusses detecting

"color edges" but not smears caused by incomplete charge transfers, as required by the claimed invention. The Action cites col. 5 lines 3-35 of Cok for disclosing "an image data replacer for replacing data between the boundaries of a detected smear with alternative image data." In the cited section, Cok discloses an iterative segmentation process associated with edges E that are assumed to exist between two pixel locations P0 and PN. There is no teaching in Cok for replacing data between the boundaries of a detected smear with alternative image data.

The Action cites Schrock for teaching "a subtractor for subtracting a signal corresponding to the charge accumulated during the transfer mode and transferred to the output register as lines corresponding to the at least one masked row, from the line signals corresponding to the rows of the image area." Schrock teaches control of a clock of an A-D converter of pixel samples exclusive of times when switching transitions occur during the sampling of the imager pixels. Schrock however fails to teach detecting the boundaries of a smear produced by incomplete charge transfer in a multiplication register and replacing data between the boundaries of the detected smear with alternative image data.

On pages 6-7 of the Office Action, the Examiner rejects claims 15-17 under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 5,040,064 to Cok, AAPA, U.S. Patent No. 5,105,276 to Schrock and further in view of U.S. Patent No. 6,313,883 to Thaler (Thaler). Having distinguished the independent claims 1 and 20 from the combination of Cok, AAPA and Schrock as reasoned above, it is submitted that the dependent claims 15-17 are also distinguished over the cited combination with or without Thaler, which similar to Schrock fails to teach detecting the boundaries of a smear produced by incomplete charge transfer in a multiplication register and replacing data between the boundaries of the detected smear with alternative image data.

CONCLUSION

Applicants respectfully submit that in view of the foregoing, all of the stated grounds of objection and rejection have been properly traversed, accommodated, or rendered moot.

Therefore, the Applicants respectfully request that the Examiner reconsider all presently outstanding objections and rejections and that they be withdrawn.

If the Examiner believes, for any reasons, that further communication will expedite prosecution of this application the Examiner is invited to telephone the undersigned at the number provided.

Accordingly, in view of the above amendments, it is believed that the remaining claims of the present invention are in condition for allowance.

Respectfully submitted,

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